

NEW AND LITTLE-KNOWN SPECIES OF *PLACODISCUS* (SAPINDACEÆ) IN WEST AFRICA

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ABSTRACT : Three new species of *Placodiscus* Radlk. are described : *P. attenuatus* J. B. Hall from Ivory Coast and Ghana, *P. bracteosus* J. B. Hall from Ivory Coast, Ghana and Nigeria, and *P. oblongifolius* J. B. Hall from Liberia, Ivory Coast and Ghana. All of these species have at some time been identified as *P. leptostachys* Radlk.; the true identity of this species is discussed, together with its relationship to *P. angustifolius* Radlk. *P. cuneatus* Radlk. is reduced to synonymy in *P. angustifolius*. The identity of *P. boya* Aubrév. & Pellegr. is clarified. A key is provided to the West and Central African species of *Placodiscus*.

RÉSUMÉ : Trois nouvelles espèces de *Placodiscus* sont décrites : *P. attenuatus* J. B. Hall (Côte d'Ivoire et Ghana), *P. bracteosus* J. B. Hall (Côte d'Ivoire, Ghana et Nigeria), et *P. oblongifolius* J. B. Hall (Liberia, Côte d'Ivoire et Ghana). Toutes ces espèces ont été quelquefois déterminées comme *P. leptostachys* Radlk.; la vraie identité de cette dernière espèce et ses rapports avec *P. angustifolius* Radlk. sont discutés. *P. cuneatus* Radlk. est considérée comme synonyme de *P. angustifolius*. *P. boya* Aubrév. & Pellegr. est clairement identifiée. Une clé est donnée pour les espèces de *Placodiscus* d'Afrique occidentale et centrale.

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The genus *Placodiscus*, consisting of understorey trees, is easily recognised by the small, apetalous flowers, with calyx incompletely divided into valvate teeth, baccate, lobed fruit, and especially by the very prominent reticulation of the leaves; the inflorescence is a branched or unbranched spiciform or racemiform thyrse, with glomerular cymules sessile or stipitate on the axis. The species of *Placodiscus*, on the other hand, have often proved difficult to distinguish. There is no evidence that the species are inherently variable; in fact KEAY (1956) remarks with respect to *P. riparius* Keay that the material is "remarkably constant". Where a species possesses some unique characteristic, such as the sessile leaves of *P. pseudostipularis* Radlk., or the leaves exceeding 1 m in length of *P. bancoensis* Aubrév. & Pellegr., there is no difficulty in naming it. The problems arise from such causes as the rarity of many species and the consequent poverty of material, their irregular and infrequent flowering, unisexuality, cauliflory resulting in scrappy herbarium specimens, and the deficiency of many herbarium labels in notes accurately describing the characteristic habit. The indumentum of the leaves and inflorescences is very characteristic, but published descriptions are often at variance with the features that can be seen by careful observation under a good binocular microscope. The presence of glandular hairs is used by FOUILLOY & HALLÉ (1973) to dis-

tinguish *P. glandulosus* Radlk. and *P. turbinatus* Radlk. from all other species, but in fact exactly similar (though smaller) hairs occur in several other species. These hairs exude hardening droplets of a reddish resin; they are similar to those of another sapindaceous plant, a species of *Lecaniodiscus* (J. B. HALL, 1980), but do not conform to the pattern of the usual capitate glandular hair.

Placodiscus angustifolius Radlkofer

In ENGL., Pflanzenreich, Sapindaceae : 813 (1932); FOUILLOY & HALLÉ, Fl. Camer. 16 : 132 (1973).

— *Placodiscus cuneatus* RADLK., in ENGL., Pflanzenreich, Sapindaceae : 814 (1932), p.p.; FOUILLOY & HALLÉ, Fl. Camer. 16 : 132 (1973), excl. Aubréville 2793; Syntypes : Zenker 2120, p.p., K!, P! (lectotype), Zenker 4684, Zenker 4698, P!, Bipindi in Cameroun, syn. nov.

TYPE : Zenker 2600, ♂ fl., Sept. 1902, Bipindi, Cameroun (BM!, P!).

RADLKOFER distinguished *P. angustifolius* from the earlier described *P. leptostachys* Radlk. mainly on the former's less pubescent disk, stipitate (not sessile) cymules, and narrower leaflets. On the basis of available material, *P. angustifolius* also seems to differ in its paniculate inflorescence which may be terminal on a leafy branch, in the presence (at least sometimes) of minute glandular hairs on the inflorescence axes, and of scattered weak hairs on the lamina near the midrib.

Placodiscus cuneatus was distinguished by RADLKOFER as having "cuneate" leaves; FOUILLOY & HALLÉ (1973) suggest some further differential characters, none of which is very convincing. The type collection (Zenker 2120) of *P. cuneatus* was recognised by RADLKOFER as being mixed with *P. glandulosus*. In fact the material of Zenker 2120 at Kew consists of two detached inflorescences and leaves. One of the inflorescences is unbranched and highly glandular; it agrees well with *P. glandulosus*. The other is paniculate, with no obvious glands, and agrees with *P. angustifolius*, as do the leaves. The material of Zenker 2120 at Paris, which I have chosen as the lectotype of *P. cuneatus*, has a similar branched inflorescence, with very minute glandular hairs on the axis, and narrowly oblong leaves similar to those of *P. angustifolius*. Zenker 4698 at Paris has large glandular hairs on the simple racemiform inflorescence, and glands on the underside of the midrib: it thus seems to be *P. glandulosus*. From the foregoing, there seems to be no good reason to maintain *P. cuneatus*. We may also note that the types of *P. angustifolius*, *P. cuneatus* and *P. glandulosus* were all collected by ZENKER at Bipindi, Cameroun.

MATERIAL STUDIED : NIGERIA : Hall 3059, Obudu Plateau, ♂ fl., 22.3.1971. — CAMEROUN : Zenker 2120, p.p., Bipindi, ♂ fl., July 1899; 2600, Bipindi, ♂ fl., Sept. 1902; De Wilde 1275, Eseka, fr. November. — CENTRAFRIQUE : Le Testu 4638, Yalinga, fl., 27.3.1923.

Placodiscus leptostachys Radlkofer

Sitzungsber. Bayer. Akad. Wiss. München 9 : 606 (1879); in ENGL., Pflanzenreich, Sapindaceae : 813 (1932), p.p., quoad Mann 2150, excl. Gossweiler 6731, 6785, 7280; KEAY, FWTA, ed. 2, 1 : 720 (1958), p.p., quoad Mann 2150, excl. Baldwin 13079, 13095, Latiilo FHI 30970; FOUILLOY & HALLÉ, Fl. Camer. 16 : 130 (1973), p.p., quoad Mann 2150, excl. Vigne 1612 & Pl. 31 : 1-3.

TYPE : Mann 2150, ♂ fl., Dec. 1862, Mt Cameroun, alt. 720 m (K!).

Many botanists have refused to believe that this species has not been found again since MANN made the type collection in 1862 and, as *P. leptostachys* has no particularly remarkable features, and is known only from scanty, poor material, specimens of a wide variety of species have been attributed to it. The GOSSWEILER specimens named as *P. leptostachys* by RADLKOEFER have since been described as *P. resendeanus* Exell & Mendonça, a species endemic to Cabinda. The BALDWIN specimens from Liberia cited by KEAY are *P. oblongifolius* J. B. Hall, and the LATIILLO specimen from Nigeria matches *P. opacus* Radlk. Vigne 1612 from Ghana is *P. bracteosus* J. B. Hall.

The area of Mt Cameroun where MANN collected his material has presumably since been cleared for banana plantations, so the chances of now getting better specimens from the type locality are not good. The possibility exists, however, that further specimens may bridge the (rather small) gaps between *P. leptostachys*, *P. angustifolius* and *P. opacus*; until then I favour maintaining all three species.

Placodiscus bracteosus J. B. Hall, sp. nov.

— *Placodiscus leptostachys* auct. non RADLK. : FOUILLOY & HALLÉ, Fl. Camer. 16 : 130 (1973), quoad Vigne 1612.

— *Placodiscus cuneatus* auct. non RADLK. : FOUILLOY & HALLÉ, Fl. Camer. 16 : 132 (1973), quoad Aubréville 2793.

— *Placodiscus* sp. A KEAY, FWTA, ed. 2, 1 : 720 (1958).

Inflorescentiis tomentosis dense floriferis, pedicellis persistentibus, bracteis 5 mm longis instructis P. bancoensi Aubrév. & Pellegr. similis (et P. leptostachyde dissimilis), sed habitu ramoso foliis nullo minoribus facilliter distinguendus.

Arbor 5-7 m. alta ramosa, ramulis ca. 8 mm diametro, glabrescentibus. Folia 3-5-jugata, omnino glabra, petiolo (3-)5-8(-12) cm longo, rhachide (10-)15-22 cm longa; foliola subcoriacea in siccitate fusca subnitida, costa recurva ergo margine in siccitate corrugata, (10-)15-25(-30) cm longa, 5-7.5 cm lata, elliptico-oblonga vel oblonga, basi leviter oblique late cuneata, apice breviter acuminata, nervis secundariis arcuatis utrinque ca. 10, petiolulo 5-8 mm longo. Inflorescentiae thyrsoides racemiformes, ab imo interdum ramosae, praecipue ex ramis maturis exortae ad 35 cm longae, rhachide 2 mm diametro velutina trichomatibus 0.1-0.2 mm longis, floribus bracteisque fere obiecta; cymula sessiles 5-10-florae, bractea ca. 5 mm longa, subulata, velutina. Flores pedicellati, pedicello 2-5 mm longo supra medio articulo, post floris abscissionem persistenti in rhachide; alabastra sphaerica 3 mm diametro; calyx cxtus intusque dense pubescens trichomatibus 0.1-0.2 mm longis, lobis ca. 1.5 mm longis, deltoides; ca. 9 stamina, 5 mm longa, filamentis pilosis; discus ca. 2 mm diametro, concavus, margine dense centro sparsim pilosus pilis 0.3 mm longis. Fructus trilobus, 4-5 cm diametro, tomentellus, citrinus, pedicello ad 8 mm longo.

TYPE : *Vigne 1612*, Ghana, Kwahu Prasu, ♀ fl., Feb. 1929 (holo-, P; iso-, K, GC, FHK).

This species was recognised by KEAY (1958) as probably distinct from *P. leptostachys*, but he hesitated to name it without further material. Specimens collected subsequently show that its features are rather constant, and that it is, in fact, a good species. FOUILLOY & HALLÉ (1973) illustrate the type specimen (Pl. 31, 1-3) as *P. leptostachys*. The inflorescence of *P. bracteosus* is strikingly similar to that of *P. bancoensis*, but the species are very different in habit and leaf characters.

OTHER MATERIAL STUDIED : IVORY COAST : *Aubréville 2793*, s. loc., ♀ fl. — GHANA : *Vigne 1612A*, Kwahu Prasu, fr., June 1929; 2694, South Fomangsu Forest Reserve, ♀ fl. & fr., Jan. 1933; *Darko 682*, Oda, ♂ fl., June 1951; *Hall 2204*, Mankessim, ♂ fl., Feb. 1962. — NIGERIA : *Clutea FHI 23967*, Ibadan North Forest Reserve, fr., Dec. 1949; *Amachi FHI 38253*, Ukpon Forest Reserve, Ogoja, fr., April 1958; *Sieferhi FHI 23646*, Gambari Forest Reserve, fr., June 1954; *Latilo FHI 34986*, Gambari Forest Reserve, fl., April 1956.

Placodiscus attenuatus J. B. Hall, *sp. nov.*

— *Placodiscus boyae* auct. non AUBRÉV. & PELLEGR. : AUBRÉVILLE, Fl. For. Côte d'Iv., ed. 2, 2 : 232 (1959), *quoad Aubréville 2017*; KEAY, FWTA, ed. 2, 1 : 720 (1958), *quoad Aubréville 2017*.

— *Placodiscus ripariis* auct. non KEAY : AKÉ ASSI, Étude Flor. Côte d'Iv. : 91 (1963), *quoad Aké Assi 5466*.

P. boyae affinis, sed foliis nonnunquam sessilibus, 1-2-jugatis, foliis basi attenuatis, inflorescentiis simplicibus non ramosis, cymulis ca. 5-floris, floribus sessilibus disco pubescenti, fructu minore, recedit.

Arbor 3-5(-15) m alta, ramosa, ramulis ca. 3 mm diametro, glabris. Folia 1-2-jugata, glabra, petiolo 0-12 cm longo, rachide 4-7 cm longa; foliola subcoriacea, nitida vel subtus opaca, 7-18 cm longa, 3-7 cm lata, ovato-elliptica, elliptica vel ovato-lanceolata, apice acuminata, basi plus minusve attenuata, nervis secundariis arcuatis utrinque 7-10, petiolulo 5-8 mm. Inflorescentiæ spiciformes, solitariæ vel 2-3-fasciculati, axillares cauliflorisve, ad 12 cm longæ, rachide ca. 1 mm diametro, minute et sparsim puberula; cymulæ sessiles, ca. 5-floræ, bractea 0.5-1.0 mm longa. Flores masculini (cum alabastris visis) sessiles, sphaerici, ca. 2.5 mm diametro; calyx extus minute puberulus trichomatibus adpressis 0.05 mm longis, intus pubescens trichomatibus 0.1 mm longis, lobis triangularibus ca. 1 mm longis; discus ut calyx interius pubescens. Fructus trilobus armeniacus, tomentellus, 2.5 cm diametro, pedicello 1-2 mm longo.

TYPE ; *Hall 2352*, Ghana, near Cape Coast, ♂ fl., Sept. 1962 (holo-, K; iso-, GC, CC).

The characteristic tufted appearance of the crown in this species results from the pattern of leaf production. Each cycle of growth starts with a leaf having a very long petiole, the next leaf has a shorter petiole, the fourth leaf or so is bijugate with a short petiole, and the cycle then finishes with two or three leaves separated by short internodes, each consisting of a pair of sessile leaflets (sometimes reduced to one leaflet), which cover the terminal bud. When each axillary bud of these reduced leaves resumes growth at the next growth cycle, the result is a pseudo-whorl of twigs.

The leaflets of larger specimens of *P. attenuatus* (e.g. Hall & Swaine GC 47223, 15 m high) may be smaller, less acuminate, and dull below, resembling those of *P. riparius*; they lack, however, the spreading puberulous indumentum which is characteristic of the undersurface of the latter species.

The leaflets often closely resemble those of *P. boya* Aubrév. & Pellegr., differing in being more attenuate at the base, and in the secondary nerves being more distinctly looped. *P. boya* may reach greater girth and height than ever seem to be attained by *P. attenuatus*, but there is overlap. A fluted bole and flaky bark are characteristic of *P. boya*, but the bole of *P. attenuatus* is smooth and cylindrical. In both species the terminal bud is covered by reddish indumentum, and a few reddish appressed hairs may consequently be found on the underside of the midrib of young leaves.

The type of *P. boya*, Aubréville 793 from Bondoukou, Ivory Coast, has male flowers and is clearly different from *P. attenuatus* in its more densely pubescent inflorescence with 1-2-flowered cymules, long pedicels, and glabrous disk. Presumably because of the similarity in its leaflets, AUBRÉVILLE & PELLEGRIN (1938) concluded that Aubréville 2017, a fruiting specimen, was of the same species, and based their description of the fruits of *P. boya* on it. In fact the disk of Aubréville 2017 is pubescent as in *P. attenuatus*, not glabrous as in the type of *P. boya*, and the leaflets also agree better with *P. attenuatus*. Fruits of true *P. boya* have been collected in Bobiri Forest Reserve, Ghana, May 1949 (Taylor FH 5272); they are described as "yellow, pear-shaped, grouped and pendulous, smell of rotting apples, with four kidney-shaped seeds per fruit, 4.5 cm long by 2.5 cm wide". The dried ripe fruit of another specimen from Bobiri, Sakyi FH 7207, April 1959, is much wrinkled, but measures 4.5 cm in length. Dried ripe fruits of *P. attenuatus* (Hall 2403B) are only 2.5 cm long and unwrinkled.

OTHER MATERIAL STUDIED: IVORY COAST: Aubréville 2017, Guiglo, fr.; Aké Assi 6275, Tiapiéu, ♂ fl., Sept. 1962; Hall & Abbw GC 45432, Taï, sterile, August 1975; Hall & Aké Assi GC 45413, M1 Tonkoui, old fr., August 1975; Aké Assi 5466, Forêt d'Adiopodoumé, sterile, Nov. 1959; Aké Assi 10478, Forêt de Sangouiné, sterile, Febr. 1979. — GHANA: Andoh FH 5093, Komenda, young fr., Oct. 1947; Mooney FH 5832, Komenda Forest Reserve, fr., Dec. 1953; Hall 698, Cape Coast, ♂ fl., Sept. 1957; Hall 2403B, Bando near Asebu, fr., Nov. 1962; Hall 2614, Brimsu near Cape Coast, ♂ fl., Sept. 1964; Hall & Abbw GC 43761, Kissi, ♂ fl., July 1972; GC 46154, Kissi, old fr., Nov. 1976; Hall GC 47087, Kissi, old fr., March 1975; GC 47221, Kissi, sterile, Jan. 1975; Hall & Swaine GC 47220, Sui River Forest Reserve, sterile, Nov. 1973; GC 47223, Subri River Forest Reserve near Daboase, sterile, Jan. 1975.

Placodiscus oblongifolius J. B. Hall, *sp. nov.*

— *Placodiscus leptostachys* auct. non RADLK.: KEAY, FWTA, ed. 2, I: 720 (1958), *quoad* Baldwin 13079 & 13095.

P. glanduloso foliis oblongis subtus glandulosis, habitu paucerramoso, affinis; sed cymulis plerumque unifloris non stipitatis, bracteis brevioribus, pedicellis brevioribus non persistentibus, rachide inflorescentiae minus glandulosa, satis distinguendus.

Arbor gracilis usque 7 m alta, truncus ad 8 cm diametro, pauce ramosa. Folia 5-7 (-9)-jugata, petiolo 10-15 (-25) cm longo, rachide 20-25 (-30) cm longa; foliola subcoriacea

nitida oblonga vel oblongo-elliptica, 15-25 cm longa, (3-4-6-7) cm lata, apice abrupte acuminata, basi obtusa vel cuneata, nervis secundariis utrinque 10-14, petiolulo 3-8 mm longo; costa nervique subtus trichonata glandulosa rubella minuta sparsim gerentes, aliter glabri. Inflorescentiæ 8-15 cm longæ præcipue caulifloræ, rhachide plerumque simplici, angulata, patente puberula, in statu florifero 1-1.5 mm diametro; cymulæ sessiles, 1-(2)-floræ, bractea 1-(2) mm longa. Alabastra subsphærica, basi truncata, 2-3 mm diametro, pedicello 1 mm longo ad immum articulo; calyx ut pedicellus extus et intus puberulus, lobis triangularibus usque 1.5 mm longis; stamina infra medium villosa (floris fœmiæi brevia, glabra); discus patelliformis glaber. Fructus trilobus, armeniacus, 2.5 cm diametro, tomentellus, pedicello 1.5 mm longo.

TYPE: *Baldwin 13095*, Liberia, Bushrod Island, ♂ fl., August 1949 (holo-, K).

P. oblongifolius is undoubtedly very close to *P. glandulosus*, a species known only from Cameroun and Gabon. The habit sketch in Herb. P accompanying *Hallé 3931*, a specimen of *P. glandulosus* collected from Belinga, Gabon, shows a slender understorey tree 7 m high with few branches at the ends of which the long leaves are crowded, and with rather short inflorescences produced along the whole length of the stem; this drawing could equally well illustrate *P. oblongifolius*. Flowers of both species may be reddish, or cream.

The degree of development of glandular hairs is rather variable in both species. In *P. oblongifolius*, glands are always present on the underside of the midrib, though they may be minute and difficult to see. The inflorescences generally lack glandular hairs, but in *Hall & Abbiw GC 45519* they are conspicuous both on the inflorescence axis and on the buds.

OTHER MATERIAL STUDIED: LIBERIA: *Baldwin 13079*, Montserrado County, Brewersville, ♀ fl. & fr., August 1949; *Cooper 13725*, Firestone Plantation, near Dukwai River, fl., April 1928; *Linder 109*, Firestone Plantation, Du River, sterile, July 1926. — IVORY COAST: *Leeuwenberg 2796*, 60 km north of Sassandra, fr., Nov. 1959; *Aké Assi 2827*, region of San Pedro, Poro to Gabo, ♂ fl. & fr., Febr. 1955; *10109*, Tabou, sterile, May 1968; *Hall & Abbiw GC 45519*, Mt Kopé, ♂ fl., August 1975; 8972, between Fresco and Bohiko, sterile, June 1966. — GHANA: *Annan FH 5759*, Benso, ♀ fl., July 1953; *Enti FH 6280*, Axim, fr., June 1956; *FH 7463*, Neung Forest Reserve, sterile, Oct. 1961.

ECOLOGICAL NOTE ON THE NEW SPECIES

HALL & SWAINE (1976) have recently produced a revised classification of Ghana's forests which has subsequently been tentatively extended (WATERMAN & al., 1978) to Ivory Coast and Nigeria.

Placodiscus oblongifolius proves to belong predominantly to the Wet Evergreen forest-type of HALL & SWAINE, though it has been recorded in the Moist Evergreen type.

P. bracteosus, on the other hand, has never been found in any of the evergreen forest-types, but occurs equally in the Moist and Dry Semi-deciduous types, with one record from a riverbank in the drier Southern Marginal type.

P. attenuatus has a curious distribution, reaching its greatest abundance in parts of the Southern Marginal type, but occurring also in Moist Semi-deciduous and Moist Evergreen forest.

KEY TO WEST AND CENTRAL AFRICAN SPECIES OF PLACODISCUS

1. All leaves sessile; lowest pair of leaflets ovate, much smaller than more distal leaflets (S. Leone to Ghana)..... *P. pseudostipularis* Radlk.
- 1'. Leaves petiolate (or some leaves sessile and others petiolate in *P. attenuatus*).
2. Inflorescence at least sometimes paniculate, with branches of similar thickness to main axis.
 3. Disk glabrous.
 4. Pedicels 5-10 mm; plant devoid of glandular hairs (Iv. Coast & Ghana; ? Cameroun)..... *P. boya* Aubrév. & Pellegr.
 - 4'. Pedicels ca. 1 mm; small glandular hairs on underside of midrib (Liberia to Ghana) *P. oblongifolius* J. B. Hall
 - 3'. Disk more or less pubescent.
 5. Inflorescence terminating a branch of the tree; branches of the inflorescence to 35 cm long, much longer than the main axis, and sometimes subtended by reduced leaves (Nigeria, Cameroun, Centrafrique; ? Zaire) *P. angustifolius* Radlk.
 - 5'. Inflorescence axillary or cauliflorous; branches of the inflorescence shorter than the main axis.
 6. Inflorescences axillary; material of this species not seen (Zaire) *P. paniculatus* Hauman
 - 6'. Inflorescences mainly cauliflorous.
 7. Bracts 5 mm long, inflorescence axis tomentose, pedicels jointed above the middle, flower buds velutinous (Iv. Coast to Nigeria) *P. bracteosus* J. B. Hall
 - 7'. Bracts 2-3 mm long, inflorescence axis and buds puberulous; pedicels jointed at base *P. leptostachys* Radlk.
 - 2'. Inflorescence racemose, or pseudoracemose with glomerular cymules on the axis, or paniculate with short woody axis much thicker than the branches.
 8. Glandular hairs (i.e. hairs encrusted with reddish, probably resinous, granules) present on some part of the plant.
 9. Pedicels 2-7 mm long, jointed just below flower buds so that when the latter fall "pegs" are left on the inflorescence axis; cymules stipitate (Cameroun, Gabon) *P. glandulosus* Radlk.
 - 9'. Pedicels shorter or flowers sessile, pedicels jointed at the base and not persisting as pegs; cymules sessile, not stipitate.
 10. Flowers with distinct pedicels ca. 1 mm long; disk completely glabrous *P. oblongifolius* J. B. Hall
 - 10'. Flowers sessile or subsessile; disk not completely glabrous.
 11. Leaves 8-12-jugate, leaflets with small glandular and non-glandular hairs on underside; unbranched or little-branched tree 3-10 m high (S. Leone to Iv. Coast) *P. splendidus* Keay
 - 11'. Leaves 8-jugate or less, leaflets without glandular hair.
 12. Mature leaves quite glabrous, 3-8-jugate (Nigeria to Gabon) *P. opacus* Radlk.
 - 12'. Mature leaves shortly spreading-puberulous.
 13. Small shrub; leaves drying dark brown; glandular hairs inconspicuous; buds ovoid to globose, disk pubescent (Gabon, Centrafrique, ? Nigeria) .. *P. caudatus* Pierre ex Radlk.
 - 13'. Tree to 12 m high; leaves drying pale; glandular hairs obvious; buds turbinate, disk subglabrous (Nigeria) *P. turbinatus* Radlk.
 - 8'. Glandular hairs completely absent.
 14. Disk glabrous.

15. Much-branched trees 10-20 m high; inflorescences axillary among the leaves or just below the leaves.
16. Midrib spreading puberulous below; cymules 3-5-flowered, pedicels 1-2 mm (S. Leone to Liberia) *P. riparius* Keay¹
- 16'. Midrib glabrous; cymules 1-2-flowered, pedicels 5-10 mm *P. boya* Aubrév. & Pellegr.
- 15'. Habit not as above; inflorescence cauliflorous.
17. Unbranched or little-branched treelet to ca. 5 m high; leaves 4-7-jugate, leaflets to 40 × 13 cm (Cabinda) *P. resendeanus* Exell & Mendonça
- 17'. Liane; leaves ca. 9-jugate, 10-16 × 4-5 cm (Zaire); material of this species not seen. *P. gimbiensis* Hauman
- 14'. Disk pubescent.
18. Unbranched or little-branched tree 5-15 m high; leaves 8-jugate or more, 50-120 cm long, crowded at ends of main stem or branches.
19. Leaves 100 cm or more long, 18-24-jugate, leaflets narrow-elliptic to lanceolate, gradually acuminate, very asymmetrical at the base, pedicels to 10 mm long, jointed below the flowers and persistent after the flowers have fallen (Iv. Coast, Ghana) *P. bancoensis* Aubrév. & Pellegr.
- 19'. Leaves 50-80 cm long, 8-12-jugate, leaflets narrowly oblong, abruptly acuminate at the apex and fairly symmetrical at the base; flowers subsessile *P. splendidus* Keay
- 18'. Much-branched trees or little-branched treelets less than 5 m high; leaves 7-jugate or less, spaced on the branches.
20. Leaves minutely puberulous on midrib, petiole and rhachis *P. caudatus* Pierre ex Radlk.
- 20'. Leaves glabrous apart from occasional scattered small hairs.
21. Bracts 5 mm long; inflorescence axis tomentose, buds velutinous *P. bracteosus* J. B. Hall
- 21'. Bracts 1-3 mm long; inflorescence axis and buds puberulous to pubescent.
22. Leaves 1-2-jugate, long petiolate and fairly large on the proximal parts of twigs sessile and smaller distally (Iv. Coast, Ghana) *P. attenuatus* J. B. Hall
- 22'. Leaves 2-8-jugate, all petiolate.
23. Leaflets shiny below, 17-30 cm long, caudate acuminate *P. leptostachys* Radlk.
- 23'. Leaflets dull below, 15-20 cm long, subacuminate to shortly acuminate.
24. Leaves 5-8-jugate, leaflets with 8-9 nerves on each side; flower-buds sessile, globose; disk more or less glabrous *P. opaeus* Radlk.
- 24'. Leaves 2-4-jugate, leaflets with ca. 12 nerves on each side; flower-buds turbinate with pedicel 1-3 mm long; disk pubescent (Zaire) *P. pynaertii* De Wild.

1. KEAY (1956) is wrong in stating that *P. riparius* has a pubescent disk.

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